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REMARKS

The following remarks are made in response to the Office Action mailed October 2, 2006. Claim 21 has been allowed. Claims 1-3, 5, 9 and 22-24 were rejected. Claim 8 has been objected to. With this Response, no claims have been amended, canceled, or added. Accordingly, claims 1-3, 5, 8-9, and 21-24 remain pending in the application and are presented for consideration and allowance.

Claim Rejections under 35 U.S.C. § 103

In the Office Action, claims 1, 2, 5, and 22-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. U.S. Patent No. 5,694,297 (the Smith Patent) in view of Herlihy et al. U.S. Patent No. 5,428,761 (the Herlihy Patent), and further in view of Chang U.S. Patent No. 5,855,064 (the Chang Patent).

Applicants' independent claim 1 is directed to a power distribution system. The power distribution system comprises a first printed circuit board and a second printed circuit board mounted on the first printed circuit board with the second printed circuit board including a capacitive coupler. A power supply is mounted on the first printed circuit board and a 64 bit processor is mounted on the second printed circuit board with the 64 bit processor spaced remotely from the power supply. A flexible cable connector comprises a first end and a second end with the first end electrically connected to the processor via the capacitive coupler of the second printed circuit board and with the second end electrically connected to the power supply. The flexible connector is configured with a length to cause the remote spacing of the power supply relative to the 64 bit processor and the flexible connector extends between the power supply and the 64 bit processor independent of the first printed circuit board. The flexible connector includes a plurality of insulated power wires and a ground structure. The plurality of insulated power wires are arranged generally parallel to each other extending from the first end to the second end of the flexible cable connector. The ground structure includes a ground shield that surrounds the plurality of insulated power wires and extends from the first end to the second end of the flexible cable connector, with the ground structure configured to provide a return path for current between the 64 bit processor and the power supply.

The Smith Patent fails to disclose all of the limitations of Applicants' claim 1. In particular, the Smith Patent does not disclose an arrangement in which a power supply is mounted on a first printed circuit board and in which a processor is mounted on a second printed circuit board with the power supply (on the first circuit board) being located remotely from the processor.

First, in the Smith Patent, switching power supply 200 (Figure 3) is provided within socket 108b (see the Smith Patent at Column 5, lines 34-39) which is the same unit (socket 108) on which package 102 is mounted. Accordingly, the Smith Patent teaches away from Applicants' claim limitation in which the processor is disposed on a second printed circuit board, which is separate and distinct unit from a first printed circuit board on which the power supply is mounted. Moreover, the socket 108 in the Smith Patent is not equivalent to a first printed circuit board or daughterboard.

Second, the Smith Patent explicitly teaches away from Applicants' claimed limitation of locating a power supply remotely from a processor, and instead the Smith Patent advocates that the DC power supply be as close as possible to the IC chips as technologically possible (see the Smith Patent at Column 2, lines 24-25, lines 40-47). The Smith Patent stresses this point even more when the IC chip is a processor. See the Smith Patent at Column 1, lines 33-46. Accordingly, the Smith Patent teaches away from Applicants' claimed system of claim 1 in which a power supply is located remotely from the processor.

This distinction is significant because placement of the power supply 200 in the Smith Patent adjacent the IC package 102 steals away valuable space immediately surrounding the footprint of the IC package 102 which could be devoted to memory or conductive circuit traces on the printed circuit board.

Third, despite the assertion in the Office Action regarding a power source 204 (not a DC power supply) being located remotely, it is apparent from Figure 2 of the Smith Patent that the Smith Patent contemplates that socket 108b holds a real power supply and not merely a switching/coupling circuit. In particular, the Smith Patent reveals a heat sink 112 for placement directly over the location of the power supply 200 at socket 108b (see the Smith Patent at Column 5, lines 34-39) to compensate for the heat generated by that power supply 200. Accordingly, the citation to a power source 204 is not directly comparable to a power supply as that term is used by the Smith Patent, and is not directly comparable to a power supply in the sense expressed in Applicants' claim 1, and therefore the Smith Patent does teach away from Applicants' claim regarding a location of a power supply relative to a processor.

Fourth, the Smith Patent fails to disclose any details regarding a flexible cable connector as claimed by Applicants.

As admitted in the Office Action, the Smith Patent fails to disclose a 64 bit processor in connection with its mounting structure 100.

The Herlihy Patent fails to cure the deficiencies of the Smith Patent. The Herlihy Patent is directed to transactional memory operations for a computer system (Abstract) and does not teach anything related to co-placement of a power supply and a processor (as disclosed in the Smith Patent) or remote placement of a power supply relative to a processor, as claimed by Applicants in independent claim 1. Accordingly, the mere fact that the Herlihy Patent mentions in passing a 64-bit RISC architecture in the context of transactional memory functions (see the Herlihy Patent at Column 3, lines 11-13) does not suggest or teach to anyone skilled in the art that an IC chip in the Smith Patent should be a 64-bit processor. Moreover, nothing in the Smith Patent suggests one skilled in the art to look to the Herlihy Patent, which has nothing to do with the problem of locating a power supply relative to a processor. Even if one skilled in the art did look to the Herlihy Patent, it would not and does not cure the many deficiencies of the Smith Patent relative to Applicants' independent claim 1. Finally, Applicant notes that the goal stated in the Office Action for linking the Smith Patent and the Herlihy Patent ("to provide loading quadword, and performs an internal byte write in the processor's register set") is simply not relevant to any of the limitations of Applicants' independent claim 1.

For these reasons, one skilled in the art would not look to the Herlihy Patent, and even if they did, one cannot combine the Smith Patent and the Herlihy Patent and achieve Applicants' independent claim 1.

As admitted in the Office Action, the Smith Patent and the Herlihy Patent fail to disclose a flexible cable connector as provided in the limitations of Applicants' independent claim 1. The Chang Patent fails to cure the already detailed deficiencies of the Smith Patent and the Herlihy Patent and introduces deficiencies of its own relative to Applicants' independent claim 1.

In one aspect, the Chang Patent fails to disclose a second printed circuit board mounted on a first printed circuit board. Instead, by the Examiner's interpretation of the Chang Patent, the Chang Patent inherently discloses a motherboard. Even if the Examiner's assertion were conceded, the Chang Patent fails to disclose anything about the structure of the motherboard, such as the mounting of a second printed circuit board on a first printed circuit board, as claimed by Applicant. Accordingly, the Chang Patent necessarily fails to disclose a 64 bit processor and in particular, a 64 bit processor mounted on the second printed circuit board, as claimed by Applicants in claim 1. Moreover, because the Herlihy Patent and the Smith Patent carry these same deficiencies as demonstrated above, all three of the Smith Patent, the Herlihy Patent, and the Chang Patent fail to disclose this limitation of Applicants' independent claim 1.

In addition, the Chang Patent does not describe a microprocessor in relation to its power supply other than in the context of the Chang Patent's description of the prior art in which the Chang Patent describes that a prior art power supply system includes output cables for connecting to the CPU and various different peripheral equipments such as hard-disk drive, floppy disk drive, monitor, and modem-facsimile board. See the Chang Patent at Column 1, lines 38-45. However, in describing the power supply systems 100, 400, the Chang Patent fails to note connecting a power supply to a CPU and instead merely identifies plugging a power plug module 120-1 to 120-4 into a corresponding subsystem (not shown) such as a hard disk drive, a monitor etc. for providing the require power for system operation. See the Chang Patent at Column 4, lines 15-19 and Column 6, lines 24-29.

Accordingly, the Chang Patent fails to cure the deficiencies of the Smith Patent and the Herlihy Patent. In further contrast, the Chang Patent fails to disclose a capacitive coupler on the second printed circuit board for operatively connecting a first end of the flexible connector to the 64 bit processor, as claimed by Applicant in independent claim 1. Instead, the Chang Patent is silent regarding a location, a type, and/or a class of processor in its computing system and is also silent regarding how and where that processor is mounted within the computing system.

Moreover, the Chang Patent fails to disclose a flexible connector that electrically connects a processor to power supply in which the very same flexible connector includes a plurality of insulated power wires arranged generally parallel to each other and a ground structure that surrounds to the plurality of power wires to provide a return path for current between the processor and the power supply, as claimed in Applicants' independent claim 1.

Instead, contrary to the assertion in the Office Action, only one of the cable groups 110- to 110-4 in the Chang Patent would extend from the power supply system 100 to corresponding PC subsystem (e.g. hard drive, etc.). Accordingly, one cannot equate the multiple cable groups 110-1 to 110-4 of cable 108 of the Chang Patent, which make independent connections to independent subsystems, with the plurality of power wires within a single connector (extending from the power supply to the processor) as claimed by Applicants in independent claim 1. For these reasons, the Chang fails to disclose the flexible cable connector in Applicants' independent claim 1.

For these reasons, the Smith Patent, the Herlihy Patent, and the Chang Patent alone or in combination, fail to teach or suggest Applicants' independent claim 1, and therefore Applicants' independent claim 1 is patentable and allowable over the Smith Patent, the Herlilhy Patent, and the Chang Patent. Dependent claims 2 and 5 are believed to be allowable as they further define patentably distinct independent claim 1.

Applicants' independent claim 22 claims a high density computing system. The system comprises a motherboard and a daughterboard mounted on the motherboard and a power supply mounted on the motherboard. A high-end processor is mounted on the daughterboard with the high-end processor including a high power parameter and a stringent current parameter. A flexible cable connector comprises a first end electrically connected to the high-end processor and a second end electrically connected to the power supply. The flexible cable connector is configured with a length so that the power supply is in a spaced relationship relative to the high-end processor with the flexible connector extending between the power supply and the high-end processor independent of the first printed circuit board. The flexible connector includes a ground structure and a plurality of insulated power wires arranged generally parallel to each other extending from the first end to the second end of the flexible cable connector. The ground structure includes a ground shield that surrounds the plurality of insulated power wires and extends from the first end to the second end of the flexible cable connector, with the ground structure configured to provide a return path for current between the high-end processor and the power supply.

The Smith Patent fails to disclose the limitations of Applicants' claim 22. In particular, the Smith Patent does not disclose an arrangement in which a power supply is mounted on a motherboard and in which a high-end processor is mounted on a daughterboard with the power supply (on the motherboard) being located remotely from the high-end processor.

First, in the Smith Patent, switching power supply 200 (Figure 3) is provided within socket 108b (see the Smith Patent at Column 5, lines 34-39) which is the same unit (socket 108) on which package 102 is mounted. Accordingly, the Smith Patent teaches away from Applicants' claim limitation in which the high-end processor is disposed on a daughterboard, which is separate and distinct unit from a motherboard on which the power supply is mounted. Moreover, the socket 108 in the Smith Patent is not equivalent to a daughterboard.

Second, the Smith Patent explicitly teaches away from Applicants' claimed limitation of locating a power supply remotely from a high-end processor, and instead the Smith Patent advocates that the DC power supply be as close as possible to the IC chips as technologically possible (see the Smith Patent at Column 2, lines 24-25, lines 40-47). The Smith Patent stresses this point even more when the IC chip is a processor. See the Smith Patent at Column 1, lines 33-46. Accordingly, the Smith Patent teaches away from Applicants' claimed system of claim 22 in which a power supply is located remotely from the high-end processor.

This distinction is significant because placement of the power supply 200 in the Smith Patent adjacent the IC package 102 steals away valuable space immediately surrounding the footprint of the IC package 102 which could be devoted to memory or conductive circuit traces on the printed circuit board.

Third, despite the assertion in the Office Action regarding a power source 204 (not a DC power supply) being located remotely, it is apparent from Figure 2 of the Smith Patent that the Smith Patent contemplates that socket 108b holds a real power supply and not merely a switching/coupling circuit. In particular, the Smith Patent reveals a heat sink 112 for placement directly over the location of the power supply 200 at socket 108b (see the Smith Patent at Column 5, lines 34-39) to compensate for the heat generated by that power supply 200. Accordingly, the citation to a power source 204 is not directly comparable to a power supply as that term is used by the Smith Patent, and is not directly comparable to a power supply in the sense expressed in Applicants' claim 22, and therefore the Smith Patent does teach away from Applicants' claim regarding a location of a power supply relative to a high-end processor.

Fourth, the Smith Patent fails to disclose any details regarding a flexible cable connector as claimed by Applicants.

Fifth, as admitted in the Office Action, the Smith Patent fails to disclose a high-end processor in connection with its mounting structure 100 (the Office Action grouped the treatment of Applicants' independent claims 1 and 22).

The Herlihy Patent fails to cure the deficiencies of the Smith Patent. The Herlihy Patent is directed to transactional memory operations for a computer system (Abstract) and does not teach anything related to co-placement of a power supply and a processor (as disclosed in the Smith Patent) or remote placement of a power supply relative to a processor, as claimed by Applicants in independent claim 22. Accordingly, the mere fact that the Herlihy Patent mentions in passing a 64-bit RISC architecture in the context of transactional memory functions (see the Herlihy Patent at Column 3, lines 11-13) does not suggest or teach to anyone skilled in the art that an IC chip in the Smith Patent should be a high-end processor. Moreover, nothing in the Smith Patent suggests one skilled in the art to look to the Herlihy Patent, which has nothing to do with the problem of locating a power supply relative to a processor. Even if one skilled in the art did look to the Herlihy Patent, it would not and does not cure the many deficiencies of the Smith Patent relative to Applicants' independent claim 22. Finally, Applicant notes that the goal stated in the Office Action for linking the Smith Patent and the Herlihy Patent ("to provide loading quadword, and performs an internal byte write in the processor's register set") is simply not relevant to any of the limitations of Applicants' independent claim 22.

For these reasons, one skilled in the art would not look to the Herlihy Patent, and even if they did, one cannot combine the Smith Patent and the Herlihy Patent and achieve Applicants' independent claim 22.

As admitted in the Office Action, the Smith Patent and the Herlihy Patent fail to disclose a flexible cable connector as provided in the limitations of Applicants' independent claim 22. The Chung Patent fails to cure the already detailed deficiencies of the Smith

Patent and the Herlihy Patent and introduces deficiencies of its own relative to Applicants' independent claim 22.

In one aspect, the Chang Patent fails to disclose a daughterboard mounted on a motherboard. Instead, by the Examiner's interpretation of the Chang Patent, the Chang Patent inherently discloses a motherboard. Even if the Examiner's assertion were conceded, the Chang Patent fails to disclose anything about the structure of the motherboard, such as the mounting of a daughterboard on a motherboard, as claimed by Applicant. Accordingly, the Chang Patent necessarily fails to disclose a high-end processor and in particular, a high-end processor mounted on the daughterboard, as claimed by Applicants in claim 22. Moreover, because the Herlihy Patent and the Smith Patent carry these same deficiencies as demonstrated above, all three of the Smith Patent, the Herlihy Patent, and the Chang Patent fail to disclose this limitation of Applicants' independent claim 22.

In addition, the Chang Patent does not describe a microprocessor in relation to its power supply other than in the context of the Chang Patent's description of the prior art in which the Chang Patent describes that a prior art power supply system includes output cables for connecting to the CPU and various different peripheral equipments such as hard-disk drive, floppy disk drive, monitor, and modem-facsimile board. See the Chang Patent at Column 1, lines 38-45. However, in describing the power supply systems 100, 400, the Chang Patent fails to note connecting a power supply to a CPU and instead merely identifies plugging a power plug module 120-1 to 120-4 into a corresponding subsystem (not shown) such as a hard disk drive, a monitor etc. for providing the require power for system operation. See the Chang Patent at Column 4, lines 15-19 and Column 6, lines 24-29.

Accordingly, the Chang Patent fails to cure the deficiencies of the Smith Patent and the Herlihy Patent. In further contrast, the Chang Patent fails to disclose a capacitive coupler on the daughterboard for operatively connecting a first end of the flexible connector to the high-end processor, as claimed by Applicant in independent claim 22. Instead, the Chang Patent is silent regarding a location, a type, and/or a class of processor in its computing system and is also silent regarding how and where that processor is mounted within the computing system.

Moreover, the Chang Patent fails to disclose a flexible connector that electrically connects a processor to power supply in which the very same flexible connector includes a plurality of insulated power wires arranged generally parallel to each other and a ground structure that surrounds to the plurality of power wires to provide a return path for current between the processor and the power supply, as claimed in Applicants' independent claim 22.

Instead, contrary to the assertion in the Office Action, only one of the cable groups 110- to 110-4 in the Chang Patent would extend from the power supply system 100 to corresponding PC subsystem (e.g. hard drive, etc.). Accordingly, one cannot equate the multiple cable groups 110-1 to 110-4 of cable 108 of the Chang Patent, which make independent connections to independent subsystems, with the plurality of power wires within a single connector (extending from the power supply to the processor) as claimed by Applicants in independent claim 22. For these reasons, the Chang fails to disclose the flexible cable connector in Applicants' independent claim 22.

For these reasons, the Smith Patent, the Herlihy Patent, and the Chang Patent alone or in combination, fail to teach or suggest Applicants' independent claim 22, and therefore Applicants' independent claim 22 is patentable and allowable over the Smith Patent, the Herlilhy Patent, and the Chang Patent. Dependent claims 23 and 24 are believed to be allowable as they further define patentably distinct independent claim 22.

In light of the above, Applicants respectfully request withdrawal of the rejection of claims 1-2, 5, and 22-24 based on the Smith Patent, the Herlihy Patent, and the Chang Patent under 35 U.S.C. §103.

Claim Rejections under 35 U.S.C. § 103

In the Office Action, claims 3 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Smith Patent in view of the Herlihy Patent, the Chang Patent, and further in view of Zell et al. U.S. Patent No. 3,914,531 (the Zell Patent).

Dependent claims 3 and 9 are also believed to be allowable based on their dependency from patentably distinct independent claim 1, which is believed to be allowable for the previously presented reasons for patentability. Moreover, the Zell Patent fails to cure the deficiencies of the Smith Patent, the Herlihy Patent, and the Chang Patent regarding the limitations of base independent claim 1 as the Zell Patent does not teach or suggest the limitations of Applicants' independent claim 1. Accordingly, one cannot combine the Smith

Patent, the Chang Patent, the Herlihy Patent, and the Zell Patent and arrive at Applicants' dependent claim 3 and 9.

For these reasons, the Smith Patent, the Herlihy Patent, the Chang Patent, and the Zell Patent, alone or in combination, fail to teach or suggest dependent claims 3 and 9, and therefore Applicants' dependent claim 3 and 9 are patentable and allowable over the Smith Patent, the Herlihy Patent, the Chang Patent, and the Zell Patent.

In light of the above, Applicants respectfully request withdrawal of the rejection of claims 3 and 9 based on the Smith Patent, the Herlihy Patent, the Chang Patent, and the Zell Patent under 35 U.S.C. §103.

Allowable Subject Matter

In the Office Action, claim 8 was objected to for being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims and if rewritten to overcome the 35 U.S.C. §112 rejections. In Applicants' last response, independent claim 21 was presented as rewritten form of dependent claim 8 and subsequently allowed.

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CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1-3, 5, 8, 9 and 21-24 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-3, 5, 8, 9 and 21-24 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(h)(i). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 08-2025.

The Examiner is invited to contact the Applicants' representative at the below-listed telephone numbers to facilitate prosecution of this application. Any inquiry regarding this Amendment and Response should be directed to either Paul S. Grunzweig at Telephone No. (612) 767-2504, Facsimile No. (612) 573-2005 or David A. Plettner at Telephone No. (408) 447-3013, Facsimile No. (408) 447-0854. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted, Andrew Barr et al.

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being facsimile transmitted to the United States Patent and Trademark Office, Fax No. (571) 273-8300 on this 4th day of December, 2006.

By____________
Name: Paul S. Grunzweig